

# **2004 SPAWNING LAKE HERRING ASSESSMENT**

## **INTRODUCTION**

Prior to the 1960s, lake herring were abundant and an important component of the commercial fisheries in Lake Superior. Although the cause of the decline is uncertain commercial over harvest may have been part of the problem. Since the 1980s lake herring abundance has increased but appears to be dependent on sporadic recruitment. Lake herring are commercially harvested primarily in the fall, during the spawning season. Lake herring are valued for their roe; thus the fishery targets unripe females. Long-term effects of commercial harvest on the population are not well understood. The objective of this assessment was to monitor the abundance and age composition of spawning lake herring at one long-term index station.

## **METHODS**

Lake herring were sampled on December 1, 2004 during the spawning period at the index station north of the Sand Island lighthouse. Gill nets were set on the bottom for 24-hours. The standard index gang consisted of 1,200 feet of monofilament net. Each net was 300 feet long and arranged in the following sequence:

2-1/2" - 1-1/2" - 2" - 3"

A subsample of herring was measured to the nearest 0.1 inch and sexed. Ages were estimated for 79 herring using scales and otoliths.

## **RESULTS AND DISCUSSION**

In 2004, 2,013 lake herring were captured with a mean length of 13.7 in (SD=1.7) (Figure 1). Lake herring catch-per-unit-effort (CPUE) increased from 2003 to 2004 (Table 1). Although variable since 1990, spawning lake herring abundance recently has been higher than in the 1970s and mid-1980s (Figure 2). The strong year classes in the late 1980's that dominated the spawning population are declining in abundance and are being replaced by the 1998 year class which constituted 68% of the sample in 2004 (Table 2).

Figure 1. Length distribution of lake herring catch from spawning assessment at Sand Island index station, 2004.

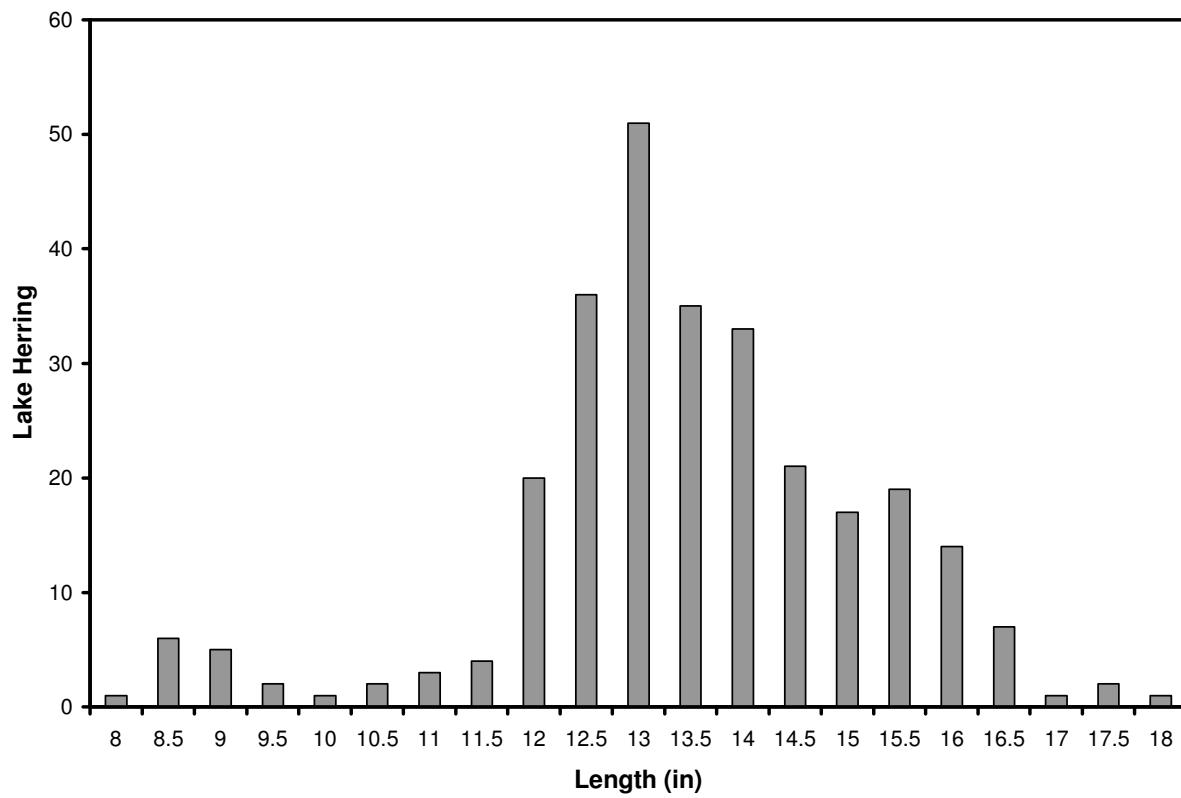


Figure 2. Spawning lake herring catch-per-unit-effort from Sand Island Shoal index station, 1972-2004.

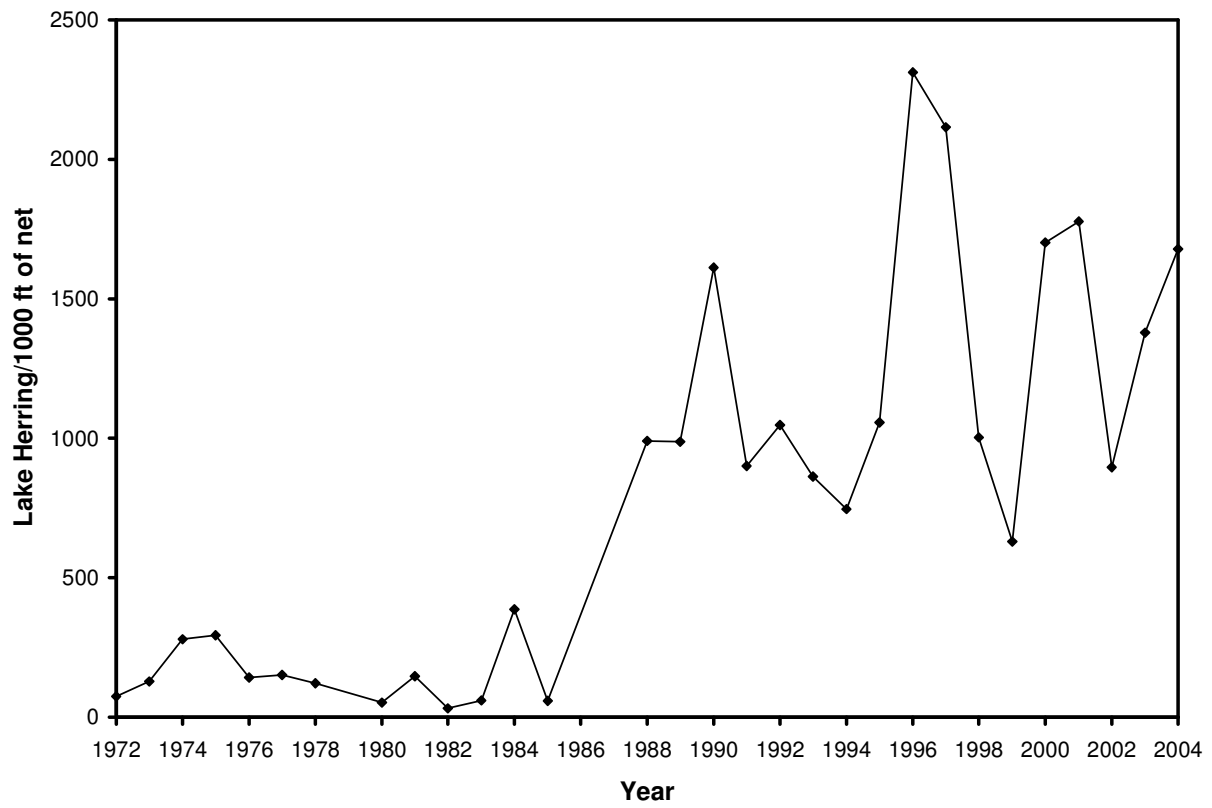


Table 1. Lake herring spawning assessment catch data from Sand Island, 1980-2004. No data was collected in 1986 and 1987.

Year	Effort (Feet)	No. Fish	CPUE/1,000'
1980	2,700	142	52.6
1981	2,700	394	145.9
1982	2,700	87	32.2
1983	2,700	162	60.0
1984	2,700	1,042	385.9
1985	2,700	156	57.7
1988	2,700	2,675	990.7
1989	1,500	1,482	988.0
1990	1,500	2,417	1,611.3
1991	1,500	1,350	900.0
1992	485	508	1,047.4
1993	1,500	1,294	862.7
1994	1,500	1,120	746.7
1995	1,500	1,586	1,057.3
1996	1,500	3,468	2,312.0
1997	1,500	3,173	2,115.3
1998	1,200	1,203	1,002.5
1999	1,200	755	629.2
2000	1,200	2,042	1,701.7
2001	1,200	2,133	1,777.5
2002	1,200	1,075	895.8
2003	1,200	1,654	1,378.3
2004	1,200	2,013	1,677.5

Table 2. Length-at-age of spawning lake herring at Sand Island, 2004.

Age	2	4	5	6	7	12	13	14
Year Class	2002	2000	1999	1998	1997	1992	1991	1990
Number	5	2	4	54	1	3	1	9
% Frequency	6	2.5	4	68	1.3	3.8	1.3	11
Mean Length (in)	8.9	11.2	10.9	12.8	14.5	16.1	13.7	14.4